

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1.-9 (Cancelled)

10. (Previously Presented) A pressure-driven membrane system for purifying water containing soluble species capable of forming sparingly soluble salts and/or minerals, comprising at least one pressure vessel having one or more membranes disposed therein; a pressure pump for producing a pressurized water stream; a plurality of controllable valves for controlling the direction of a feed flow and a concentrate flow therein; wherein said system comprises a control unit linked to said valves, wherein said control unit is adapted to provide said valves with control signals for periodically reversing the direction of said feed and concentrate flows via said pressure vessel within determined time periods corresponding to the induction time related to said salts and/or mineral and said one or more membrane, and a crystallizer adapted to receive said concentrate withdrawn from said pressure vessel, for precipitating one or more sparingly soluble salts and/or minerals in said crystallizer.

11. (Original) A system according to claim 10, wherein the induction time is estimated by the control unit according to the formula

$$\tau = e^{\frac{A}{[\ln(S)]^2} + B}, \text{ wherein A and B are salt/mineral and membrane related constants and S}$$

is the ratio between the maximum actual activity product of a given sparingly salt in the solution next to the high pressure side of the membrane and the thermodynamic solubility product, or, for

an undissociated mineral, the ratio of the actual maximum mineral concentration to the saturation concentration of that mineral for the given composition, said ratio being determined by utilizing sensing means linked to said control unit and adapted to provide it with signals corresponding to said actual activity product.

12. (Original) A system for purifying water containing soluble species capable of forming sparingly soluble salts and/or minerals according to claim 10, comprising:

a. At least one pressure vessel having one or more membranes disposed therein, said at least one vessel comprising at least a first, second, and third openings wherein said third opening is used for recovering the permeate and is in fluid communication with the interior of said vessel via said membranes;

b. a pressure pump for producing a pressurized water stream;

c. at least a first and a second controllable directional control valves wherein a first port of said first and second valves are connected to each other, a second port of said first valve is connected to said pump, a second port of said second valve is connected to said second opening of said pressure vessel, a third port of said first valve is connected to said first opening of said pressure vessel, and a third port of said second valve is connected to a concentrate exit;

d. at least one two-way controllable bypass-valve for connecting said first opening of said pressure vessel to said concentrate exit; and

e. a control unit linked to said valves, wherein said control unit is adapted to provide said valves with control signals for periodically reversing a flow direction via said pressure vessel within determined time periods.

13. (Previously Presented) A system according to claim 10, wherein the control unit is capable of estimating the induction time using the following equation:

$$\ln(\tau) = \frac{A}{[\ln(S)]^2} + B$$

upon receipt of A and B, said control unit receiving data from at least two sensing devices linked thereto, said sensors being capable of sensing the concentration level of at least one salt in the water stream at the vicinity of the first and second opening of the pressure vessel, and from a permeate and concentrate flow measuring devices, wherein said sensing and measuring devices provide said controller with corresponding signals for calculating S, or said control unit receives the value of S as an input, and thereby estimating said induction time.

14. (Previously Presented) A system according to claim 10, wherein at least one of the membranes is a spiral wound element.

15. (Previously Presented) A system according to claim 10, wherein at least one of the membranes is a hollow fiber element having an internal diameter smaller than 3 mm.

16. (Previously Presented) A system according to claim 10, wherein at least one of the membranes is of a plate and frame geometry.

17. (Previously Presented) A system according to claim 10 wherein, at least one of the membranes is of a tubular geometry having an internal diameter greater than 3 mm.

18. (Canceled)
19. (Previously Presented) A system according to claim 10, wherein the crystallizer is in the form of a vessel containing seeds.
20. (Previously Presented) A system according to claim 10, wherein the crystallizer is in the form of a fluidized bed.
21. (Previously Presented) A system according to claim 10, wherein the crystallizer is in the form of a fixed bed.
22. (Previously Presented) A system according to claim 10, wherein the crystallizer comprises membrane barrier mounted therein to allow the separation of the precipitate.